REMARKS

The Examiner has rejected claims 1-6 under 35 U.S.C. 103(a) as being unpatentable over Etheridge et al. (5,986,637) in view of Daniels et al. (6,421,619).

Regarding claim 1, Etheridge et al. discloses that the claimed feature of a method of operating an oscilloscope that is capable of displaying simultaneously multiple waveforms representing time evolution of a signal during respective acquisition intervals, comprising: a) acquiring [30] waveform data using a first set of acquisition parameters (See Fig.1, Fig. 3); b) generating [50] a display based on the waveform data acquired in step a), in the event that the display generated in step b) includes a waveform that is visually distinct from other displayed waveforms (See Fig. 1, Fig. 3, Abstract, col. 11, lines 44-46); c) selecting [57] a feature that distinguishes the visually distinct waveform from other displayed waveforms, (See Fig. 1, Fig. 3, Abstract, col. 11, lines 46-51); d) automatically deriving [55, 57] acquisition parameters that discriminate between the selected feature and other features of the displayed waveforms, (See Fig. 1, Fig. 3, Abstract, col. 3, line 35 - col. 4, line 6, col. 11, line 20 - col.12, line 17); e) acquiring [30] waveform data using the acquisition parameters derives in step d), and f) generating [50] a display ["new composition image"] based on the waveform data acquired in step e) (See Fig. 1, Fig. 3, col. 3, line 35 - col. 4, line 6, col. 11 lines 20 - col. 12 line 17).

Etheridge et al. does not specifically disclose that "acquiring waveform data using automatically derived acquisition parameters that discriminate between the selected feature and other features of the displayed waveform". However, such limitations are shown in the teaching of Daniels et al. ["an oscilloscope for automatically analyzing an input signal, utilizing each of plurality of triggering modes and trigger parameters specified for each triggering mode"]. (See Abstract, col. 1, lines 11-17, col 1, line 65 - col. 2, line 20, col. 3, lines 1-10, col. 5, line 26+) It would have been obvious to one skilled in the art to incorporate the teaching of Daniels into the teaching of Etheridge et al., in order to assist a user with not complicated way of operating an oscilloscope, as such improvement is also advantageously desirable in the teaching of Etheridge et al. for providing clear visual representation for selecting and combining various display parameters with simple and uncomplicated operation at faster processing time.

Regarding claim 2, Etheridge et al. discloses that step c) includes graphically defining a template that specifies the selected feature and step d) includes employing information regarding the template to derive additional acquisition parameters. (See Fig. 1, Fig, 3, col. 12,
lines 9-16)

Regarding claim 3, Etheridge et al. discloses that the oscilloscope has multiple trigger modes [20], step c) includes graphically defining a template that specifies the

selected feature and step d) includes employing information regarding the template to select a trigger mode for preferentially acquiring waveforms that include the selected feature. (See Fig. 1, Fig. 2, Fig. 3, Abstract, col. 3, lines 35 - col. 4, lines 6)

Regarding claim 4, refer to the discussion for the claim hereinabove, Etheridge et al. discloses that the template is a scalable rectangular box and step c) includes positioning and sizing the box so that it contains the selected feature. (See Fig. 1, Fig. 3, Abstract, col. 3, line 35 - col. 4, line 6)

Regarding claim 5, refer to the discussion for the claim 1 hereinabove, Etheridge et al. discloses that the oscilloscope has a display screen on which the waveforms are displayed and the template is a sketch generated on the display screen. (See Fig. 1, Fig. 3, Abstract, col. 3, line 35 - col. 4, lines 6)

Regarding claim 6, claim 6 is similar in scope to the claim 1, and thus the rejection of claim 1 hereinabove is also applicable to claim 6.

The Examiner has rejected claims 1-6 under 35 U.S.C. 103(a) as being unpatentable over Etheridge et al. (5,986,637) in view of Trsar et al. (5,852,789).

Regarding claim 1, Etheridge et al. discloses that the claimed feature of a method of operating an oscilloscope that is capable of displaying simultaneously multiple waveforms representing time evolution of a signal during respective acquisition intervals, comprising: a) acquiring [30] waveform data using a first set of acquisition parameters (See Fig.1, Fig. 3); b) generating [50] a display based on the waveform data acquired in step a), in the event that the display generated in step b) includes a waveform that is visually distinct from other displayed waveforms (See Fig. 1, Fig. 3, Abstract, col. 11, lines 44-46); c) selecting [57] a feature that distinguishes the visually distinct waveform from other displayed waveforms, (See Fig. 1, Fig. 3, Abstract, col. 11, lines 46-51); d) automatically deriving [55, 57] acquisition parameters that discriminate between the selected feature and other features of the displayed waveforms, (See Fig. 1, Fig. 3, Abstract, col. 3, line 35 - col. 4, line 6, col. 11, line 20 - col.12, line 17); e) acquiring [30] waveform data using the acquisition parameters derives in step d), and f) generating [50] a display ["new composition image"] based on the waveform data acquired in step e) (See Fig. 1, Fig. 3, col. 3, line 35 - col. 4, line 6, col. 11 lines 20 - col. 12 line 17).

Etheridge et al. does not specifically disclose that "acquiring waveform data using automatically derived acquisition parameters that discriminate between the selected feature and other features of the displayed waveform". However, such limitations are shown in the teaching of Trsar et al. (See Abstract line 12-23, col. 2, line 13-56, col. 4, lines 36-49, col. 9, lines 38-47) It would have been obvious to one skilled in the art to incorporate the teaching of Trsar et al. into the teaching of Etheridge et al., in order to assist a user with not complicated way of operating an oscilloscope, as such improvement is also advantageously

desirable in the teaching of Etheridge et al. for providing clear visual representation for selecting and combining various display parameters with simple and uncomplicated operation at faster processing time.

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lines 9-16)

Regarding claim 3, Etheridge et al. discloses that the oscilloscope has multiple trigger modes [20], step c) includes graphically defining a template that specifies the selected feature and step d) includes employing information regarding the template to select a trigger mode for preferentially acquiring waveforms that include the selected feature. (See Fig. 1, Fig. 2, Fig. 3, Abstract, col. 3, lines 35 - col. 4, lines 6)

Regarding claim 4, refer to the discussion for the claim hereinabove, Etheridge et al. discloses that the template is a scalable rectangular box and step c) includes positioning and sizing the box so that it contains the selected feature. (See Fig. 1, Fig. 3, Abstract, col. 3, line 35 - col. 4, line 6)

Regarding claim 5, refer to the discussion for the claim 1 hereinabove, Etheridge et al. discloses that the oscilloscope has a display screen on which the waveforms are displayed and the template is a sketch generated on the display screen. (See Fig. 1, Fig. 3, Abstract, col. 3, line 35 - col. 4, lines 6)

Regarding claim 6, claim 6 is similar in scope to the claim 1, and thus the rejection of claim 1 hereinabove is also applicable to claim 6.

The Examiner has considered Applicant's arguments with respect to claims 1-6 but are considered moot in view of the new ground(s) of rejection.

Applicants' claim invention is an oscilloscope and its method of operation that is capable of displaying simultaneously multiple waveforms representing time evolution of a signal during respective acquisition intervals. The oscilloscope has acquisition means for acquiring waveform data using a first set of acquisition parameters and display means for generating a display based on the waveform data acquired by the acquisition means. User control means are provided for selecting a feature that distinguishes a visually distinct waveform from other displayed waveforms when the display generated by the display means includes a waveform that is visually distinct from other displayed waveforms. An oscilloscope control means is provided for automatically deriving acquisition parameters that discriminate between the selected feature and other features of the displayed waveforms, and for supplying the derived acquisition parameters to the acquisition means, whereby the acquisition means can acquire waveform data using the derived acquisition parameters and

the display means can generate a display based on the waveform data acquired by the acquisition means using the derived acquisition parameters.

Etheridge et al. teaches a digital oscilloscope having significantly higher "live" time, i.e. time during which the input signal is being actively monitored, by using high speed data manipulation and compression in a rasterizer acquisition system prior to loading a display raster memory. The digital oscilloscope has acquisition circuitry for digitizing and storing digital data samples of an input signal as acquisition records in an acquisition memory. The digital data samples of the acquisition memory are provided to an acquisition rasterizer. The rasterizer contains circuitry for concurrently rasterizing and combining the results of several acquisitions together and combining with a stored composite raster image to produce a new composite raster image, while additional acquisition records are being created and stored in the acquisition memory. A display system containing the another raster memory takes the composite raster images after they contain the results of many acquisitions and overlays these single bit raster images on the multi-bit raster image of the display raster memory. The number of new pixels turned on as a result of each acquisition can be counted during the combining process and used to stop acquisitions, signal the operator, or specially treat that particular acquisition when the number of new pixels created by a particular acquisition exceeds a predetermined value.

Daniels et al. teaches a data processing system and method included within an oscilloscope for analyzing an signal input to the oscilloscope. The oscilloscope includes a plurality of triggers modes which a user can manually prioritize. For each trigger mode, the user specifies trigger parameters that include start and stop voltage levels, a step voltage level, and a sweep rate for each voltage level. The oscilloscope operates in an automatic mode using the user defined trigger parameters to analyze an input signal. The oscilloscope applies each trigger mode and each set of parameters for the trigger modes to the acquired input signal. For each instance that the oscilloscope is triggered, the waveform and associated trigger parameters are stored in a memory for future, further analysis.

Trsar et al. (USP 5,852,789) teaches an engine analyzer having user selectable parameters for identifying stored digitized waveform patterns corresponding to different vehicles and/or engines from a library of stored waveform patterns. The engine analyzer includes a waveform acquisition module, a display module and a central processor for acquiring, digitizing and storing an analog input signal from the vehicle engine and displaying it on a first trace of the display module in accordance with the selected display parameters. The engine analyzer automatically searches through the library of stored digitized waveform patterns to select those stored digitized waveform patterns that correspond to the vehicle under test and the user entered parameters. The selected relevant patterns are then displayed selectively, one at a time on a second trace of the

display module. The user can then compare the displayed waveform patterns from the library with the acquired waveform pattern from the engine under test.

Combining the teachings of Etheridge et al. individually or in combination with Daniels et al. and/or Trsar et al. does not render obvious the claims in the instant application. Etheridge et al. does not teach selecting a feature that distinguishes the visually distinct waveform from other displayed waveforms and automatically deriving acquisition parameters that discriminate between the selected feature and other features of the display waveform as asserted buy the Examiner. Etheridge et al. teaches establishing a reference raster image from acquired waveform data and providing the reference template raster image to the acquisition rasterizer for counting "new" pixels associated with each new acquisition as it is rasterized. The new pixel count for individual acquisitions can be consolidated into a new count for the composited raster image. The new count can be used by the display/system processor for storing the composited image for future analysis, displaying the image in a different color or stopping further acquisition so that the image may be further analyzed. There is no teaching hint, nor suggestion in Etheridge et al. of selecting a feature that distinguishes the visually distinct waveform from other displayed waveforms and automatically deriving acquisition parameters that discriminate between the selected feature and other features of the display waveform. The reference template raster image is used by the rasterizer for generating a raster image display of the acquired waveforms but is not used in any way for automatically deriving acquisition parameters that discriminate between the selected feature and other features of the display waveform.

Combining the teachings of Etheridge et al. with Daniels et al. does not render obvious the claims recited in Applicants' application. The result of such a combination would be an oscilloscope that automatically and sequentially applies each trigger mode and each set of parameters for each of the trigger modes to the acquired input signal. In contradistinction, Applicants' claimed invention selects a feature that distinguishes the visually distinct waveform from other displayed waveforms, automatically derives acquisition parameters that discriminate between the selected feature and other features of the display waveform and acquires waveform data using the derived acquisition parameters. Applicants' claimed invention does not automatically and sequentially apply each trigger mode and each set of parameters for each of the trigger modes to the acquired input signal as taught by Daniels et al.

Combining the teachings of Etheridge et al. with Trsar et al. does not render obvious the claims recited in Applicants' application. The result of such a combination would be an oscilloscope where a library of stored digitized waveform patterns is searched to select those stored digitized waveform patterns that correspond to the vehicle under test and the user entered parameters. The selected relevant patterns are then displayed selectively, one

at a time on a second trace of the display module. The user then compares the displayed waveform patterns from the library with the acquired waveform pattern from the engine under test. In contradistinction, Applicants' claimed invention selects a feature that distinguishes the visually distinct waveform from other displayed waveforms, automatically derives acquisition parameters that discriminate between the selected feature and other features of the display waveform and acquires waveform data using the derived acquisition parameters. Applicants' claimed invention does not search a library of stored digitized waveform patterns based on previously input user parameters to select those stored digitized waveform patterns that correspond to the user entered parameters for the purpose of displaying the selected stored digital waveform patterns. Applicants' claimed invention recites automatically derives acquisition parameters that discriminate between the selected feature and other features of the display waveform and acquires waveform data using the derived acquisition parameters. Trsar et al. teaches manually setting the parameters for the engine analyzer with the engine analyzer automatically selecting stored digitized waveform patterns based on the selected parameter settings.

Regarding claim 6, the scope of claim 6 is similar to claim 1 and the remarks made with regard to claim 1 overcoming the rejection under 35 U.S.C. 103(a) as being unpatentable over Etheridge et al. in view of Daniels et al. and Trsar et al. hold for claim 6.

Claims 2 through 5 depend from claim 1 and include all of the limitations of claim 1. Therefore, claims 2 through 5 are patentable over Etheridge et al., Daniels et al. and Trsar et al. for at least the same reasons given with respect to claim 1. More specifically, Etheridge et al. does not teach, hint nor suggest employing information regarding a template to derive additional acquisition parameters as recited in claim 2. Etheridge et al. teaches a rasterization system for a digital oscilloscope that increases the percentage of time that the input signal is actively monitored. The teaching of Etheridge et al. is to processing acquired waveform data by the rasterizer and not to automatically deriving acquisition parameters that discriminates a selected feature from other features of a displayed waveform and acquiring waveform data using the derived acquisition parameters.

Nor does Etheridge et al. teach, hint, or suggest employing information regarding a template to select a trigger mode for preferentially acquiring waveforms that include the selected feature as recited in claim 3. Etheridge et al. teaches that the reference template raster image can be used for counting "new" pixels associated with each new acquisition as it is rasterized. The new pixel count for individual acquisitions can be consolidated into a new count for the composited raster image. The new count can be used by the display/system processor for storing the composited image for future analysis, displaying the image in a different color or stopping further acquisition so that the image may be further analyzed. There is nothing in the teaching of Etheridge et al. about using the reference

template raster image to select a trigger mode for preferentially acquiring waveforms that include the selected feature.

Nor does Etheridge et al. teach, hint, or suggest that the template is a scalable rectangular box that includes positioning and sizing the box so that it contains the selected feature as recited in claim 4. There is no teaching in Etheridge et al. describing or discussing a scalable rectangular box.

Nor does Etheridge et al. teach, hint or suggest that the template is a sketch generated on the display screen as recited in claim 5. The reference template raster image as taught by Etheridge et al. is generated by the acquisition and rasterization of waveform data while ignoring the new pixel counts. The reference template raster image is the output of the rasterizer which is stored in the raster acquisition memory. Once the reference template raster image is stored in the raster acquisition memory, the new pixel count is initiated which can be used to identify acquisition that depart from the reference image.

In view of the above remarks, Applicants respectfully request withdrawal of the rejections of claims 1-6 under 35 U.S.C. 103(a) and pass this case to issue.

In accordance with current Patent Office practice, the Examiner is expressly authorized to call the undersigned agent at the number listed below if it is deemed the application is in other than condition for allowance or if prosecution can be expedited.

Respectfully submitted,

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